

---

# Game Dev @ BioWare

Career Development Report (Work Term 2)

APSC 210

University of British Columbia

---

Muchen He

Associate Developer, BioWare Edmonton

44638154

July 5, 2018

# Contents

<b>0</b>	<b>Introduction</b>	<b>1</b>
0.1	Outline . . . . .	1
0.2	Scope . . . . .	1
0.3	Industry . . . . .	1
0.4	Company . . . . .	1
<b>1</b>	<b>Work Term Industry</b>	<b>2</b>
1.1	Industry History . . . . .	2
1.2	Economic Status . . . . .	2
1.3	Geographics & Concentrations . . . . .	3
1.4	Opportunities for Engineers . . . . .	3
1.5	Employers in the Industry . . . . .	4
1.6	Economic Factors . . . . .	4
1.7	Political Factors . . . . .	4
<b>2</b>	<b>Obtained Skills</b>	<b>5</b>
2.1	Technical Skills . . . . .	5
2.1.1	Fundamental & Development Skills . . . . .	5
2.1.2	Programming Skills . . . . .	5
2.1.3	Specific Toolset Skills . . . . .	5
2.2	Non-Technical Skills . . . . .	5
<b>3</b>	<b>Desired Future Industry</b>	<b>6</b>
3.1	Industry History . . . . .	6
3.2	Economic Status . . . . .	6
3.3	Geographics & Concentrations . . . . .	6
3.4	Opportunities for Engineers . . . . .	6
3.5	Employers in the Industry . . . . .	6
3.6	Economic Factors . . . . .	6
3.7	Political Factors . . . . .	6
<b>4</b>	<b>Technical &amp; Transferable Skills for Senior Work Terms</b>	<b>6</b>
4.1	Self-Marketable Skills . . . . .	6
4.2	Skills Required to Succeed . . . . .	6
4.3	Plan to Obtain . . . . .	6
	<b>Conclusion</b>	<b>6</b>

**List of Figures**

1	BioWare logos . . . . .	2
2	EA Earnings by Type . . . . .	3
3	Video game as career . . . . .	4

**List of Tables**

## 0 Introduction

### 0.1 Outline

This report serves to probe the progression of career development. This report is written with intent to achieve helping us gauge our current desired career path by reviewing the skills obtained throughout the work term, as well as future desired skills that would be necessary for future careers.

The report is broken down into four parts to help us understand what is it we need to proceed in our career development: industry in current work term, current skills being obtained, desired future industry, and transferable skills that might aid us reaching there.

The report will also briefly describe the company and the industry it takes position in. The studio that I work for is BioWare, which is a subsidiary of a larger publisher, Electronic Arts (EA).

### 0.2 Scope

The scope of report consists of analysis of skills and duty pertained to me and future desired skills. The report will not include details about the game, engine, or other technology used during the work term that helped me obtaining skills or reach my objectives.

### 0.3 Industry

EA or BioWare, like many other studios or publishers exist in the market right now falls into the consumer entertainment industry. The products produced is associated with Microsoft and Sony as they develop the hardware the games will run on. Future industries I wish to work in consist of electronics development or robotics and control systems.

*Work Term Industry* (section 1) provides insight the industry with which we are currently working and competing in. This section outlines the company's position and its competitions in the gaming and or online entertainment and content delivery industry.

### 0.4 Company

BioWare is a game development studio founded in 1995 by three medical doctors in Edmonton, Alberta[3]. Since the establishment, BioWare has developed numerous titles including the Mass Effect and Dragon Age franchise as well as the massive multiplier online (MMO) game Star Wars: The Old Republic. BioWare is currently developing Anthem, the upcoming game set to release in February, 2019.

The company is now a division of EA, which is an American video game publishing company. This allows for cross-studio sharing of technology. Such as using the Frostbite engine (game engine developed by another EA studio, DICE, in Sweden) instead of using the in-house engine BioWare developed [4][5]. In 2018, BioWare went through rebranding that replaced the logos (figure 1).[3]



(a) BioWare logo in 1995



(b) BioWare logo prior to rebranding



(c) BioWare logo in 2018

Figure 1: BioWare logos

There is a pipeline of games the studio outputs, the latest one being Anthem, showcased at the Electronic Entertainment Expo (E3) in 2017 and 2018. The game so far has won many E3 awards.

To date, there are 800 active employees working at BioWare ranging from artists to programmers. My position is an associate developer on the UI/UX team for the game Anthem. Mostly developing engine tools, and elements the scriptwriters and artists can then use to add feature into the game.

## 1 Work Term Industry

BioWare is computer software company that develops video games for PCs, XBOX, and PlayStation. Thus we fall under *Services - Computer Programming / Software* industry.

We will also examine the video game industry in depth because of its relevance and size.

### 1.1 Industry History

The software industry primary focuses on developing computer programs as service (SaaS) or product that started in the 1950s. Recently, open source solutions and internet of things (IoT) are popular.[9]

The history of video game industry started in the 1970s when computers are powerful enough to run games even though videos existed since the 40s. Recently, the video game industry has expanded to many platforms including social media, mobile, augmented reality (AR) and virtual reality (VR).[13][14]

### 1.2 Economic Status

The video game industry economic status is growing as

Earlier games in the industry are generally cheap inexpensive to make because of small teams and low demand for quality from the consumers. In recent decades however, large budget games (A.K.A AAA or Triple A games) consists of large development teams and usually takes a year to three year to develop a single game. This is due to increased technological complexity.[12]

In 2017, the video game industry was valued at 17.68 billion USD. [14].

One competitor in the industry, Rockstar, and their most recent products Grand Theft Auto V (GTA 5) has become the most profitable product in the industry [1]. With a total revenue of \$6 billion, it has made "more money than any film, book, or game".

EA's earnings is as show below (figure 2)[6]. As shown, there is an increasing amount of income from "Live Services". This includes the after-sale content such as downloadable contents (DLCs) and micro-transactions (MTX) within the published games. Due to its financial appeal, Anthem will follow the same

*live services* model. The game will feature purchasable cosmetic items and will not have “lootboxes” (more details in economic factors section).

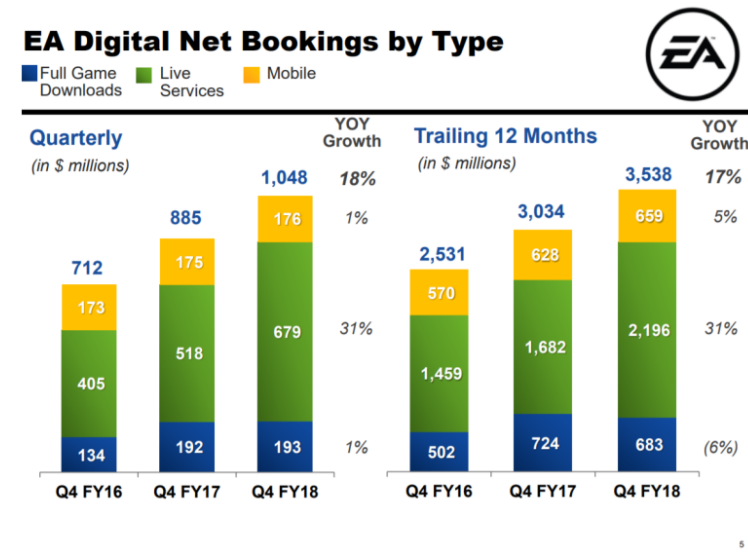


Figure 2: EA Earnings by Type

### 1.3 Geographics & Concentrations

The software industry is global. Industry leaders are based in USA. Because one can contribute to software from any computer, there is a large amount of freelancers or open-source contributors that can work from around the world.

The video game industry also applies worldwide. The USA is one of the largest producer of video games, most companies and publishers including Electronic Arts, Blizzard - Activision, and Valve (they own the world's largest online video game distribution platform - Steam [11]).

The largest market is China, with MMO games on PC being the largest category [15][16].

## 1.4 Opportunities for Engineers

For the video game industry, even though the products are viewed as entertainment or arts by the public, there are still many critical roles for engineers. According to Carlos Guerrero, a senior producer at EA, who had worked on games including World of Warcraft (WoW) and Overwatch, there are many technologies that goes into a game that need to be developed and maintained.

The following chart depicts various roles that goes into making a game (figure 3). In fact, the engineers make up a critical part: from video game engine development to online system infrastructure.

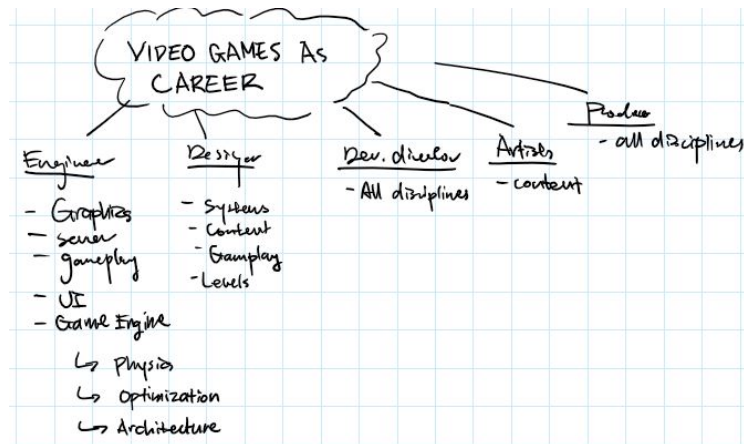


Figure 3: Video game as career

## 1.5 Employers in the Industry

For computer programming / software industry, the most notable industries include Microsoft, SAP, and ADP. Google and Amazon are also in the industry. Google is advertisement company with its parent company Alphabet owning several subsidiaries in AI research. Likewise, Amazon world's largest cloud computing service Amazon Web Services (AWS).

In the scope of the video game industry, EA is one of the biggest publisher in North America which owns subsidiaries including BioWare and DICE.

Another large video game publisher is from the giant Tencent, a Chinese internet company. They own Riot, a studio that developed League of Legends (LoL) which has 27 million players daily and an E-sports scene with over 11 million viewership.[7]

## 1.6 Economic Factors

This section intentionally left blank (not applicable).

## 1.7 Political Factors

This section intentionally left blank (not applicable).

## 2 Obtained Skills

This section provides an overview of my technical and non-technical skills gained at BioWare over the course of the work term.

Social skills: - Asking for help from anyone in the office - Participating in design review

### 2.1 Technical Skills

Being in a technical co-op position, the primary skills are comprised of technical skills in software development. The technical skills can be broken down into: fundamental and development workflow skills, programming skills,, and skills involving specific toolsets.

#### 2.1.1 Fundamental & Development Skills

The first category of skills involves fundamentally useful abilities in a development studio.

To succeed in this position, one should be proficient in understanding and using version control solutions such as Git (most common) or Perforce (used in enterprise such as Google and EA). Version control is especially important as there are tens or hundreds of developers working on the same project or codebase. It is not uncommon that multiple files undergo “conflict” as the same file could be worked on by multiple developers. Therefore explicit version tracking and tools are vital to the workflow.

*It is worth noting that since everyone is working off of the same depot that contains the source code and game data, if one were to break the build, everyone would be affected resulting in many work hours lost.*

One should also be comfortable working with packages and modules (along with its associated package managers) since this makes the project more modular.

- Work with packages and modules that are separated from the game codebase - Agile methodologies including code review, creating and resolving JIRA tasks - Contributing to the documentation (confluence, wiki, etc)

#### 2.1.2 Programming Skills

- Gained more programming experience in C++ - specifically, OOP and design patterns for games engines (render thread, simulation thread, UI handling) - Gained experience in writing C# for applications - Use python to write upgrade script for game assets - Writing code that complies with coding standard - Improved debugging in general

#### 2.1.3 Specific Toolset Skills

- Increased learning skill of using propriatery engine editor - Visual scripting - Understood the structure and serialization of these assets, as well as the entities and links within - Improved debugging skills in Visual Studio

### 2.2 Non-Technical Skills

- How to learn individually by looking to the code - Finding work for myself - Know how to google / stackoverflow for solutions



### 3 Desired Future Industry

I have three options:

1. (Depth) - Continue down the software development path on UI/UX or app development. Although drifted from area of study, could be a viable option to consolidate existing skills and experiences

Possible industries: - Software development (Microsoft, Google, Startups) - Video game industry (Coming back to EA or other game publishers)

Benefits: - Already know a lot of things - Easier integration and on boarding for future opportunities

Tradeoffs: - The experiences and skills in this particular area snowballs: because the more experiences I have as software developer, the more likely I would get a position that is software developer in the future - Not very hands on, sometimes could get very abstract = less personal satisfaction.

2. (Breadth) - Try something else to expand my set of skills to different areas. - Include and apply knowledge more related to area of study (electronics, mechanical, controls, robotics, PCB, etc)

Possible industries: - Electronics and hardware (Intel, etc) - Robotics or control systems

Benefits: - Experience new things, gain insight and additional interests - Technical experience is not fixated on software development - More hands on

3. (Academic or Research) - Research positions (universities, NRC, CSA, etc.) - Research discipline can be both computer science or research regarding electronics or control systems

Benefits: - Research experience - Grad school recommendations

#### 3.1 Industry History

#### 3.2 Economic Status

#### 3.3 Geographics & Concentrations

#### 3.4 Opportunities for Engineers

#### 3.5 Employers in the Industry

#### 3.6 Economic Factors

#### 3.7 Political Factors

### 4 Technical & Transferable Skills for Senior Work Terms

Technical communication skills - Documentation contribution - Coding standard

Learning Skills - Asking for help - Knowing how to get help -

Social skills - Small talks

#### 4.1 Self-Marketable Skills

#### 4.2 Skills Required to Succeed

#### 4.3 Plan to Obtain

### Conclusion

### References

- [1] Arif, S. (2018, April 9). GTA 5 Has Made More Money Than Any Film, Book, or Game, Says Analyst. Retrieved May 10, 2018, from <http://ca.ign.com/articles/2018/04/09/gta-5-has-made-more-money-than-any-film-book-or-game-says-analyst>
- [2] BioWare — Rich Stories, Unforgettable Characters, And Vast Worlds. (2018). Retrieved May 23, 2018, from <http://www.bioware.com/en/>

- [3] BioWare. (2018, May 23). Retrieved May 23, 2018, from <https://en.wikipedia.org/wiki/BioWare>
- [4] Frostbite (game engine). (2018). Retrieved June 27, 2018, from [https://en.wikipedia.org/wiki/Frostbite\\_\(game\\_engine\)](https://en.wikipedia.org/wiki/Frostbite_(game_engine))
- [5] EA DICE. (2018). Retrieved June 27, 2018, from [https://en.wikipedia.org/wiki/EA\\_DICE](https://en.wikipedia.org/wiki/EA_DICE)
- [6] EA. (Jan 30, 2018). Electronic Arts Reports Q3 FY18 Financial Results. Retrieved July 5, 2018, from <http://news.ea.com/press-release/company-news/electronic-arts-reports-q3-fy18-financial-results>
- [7] League of Legends. (2018). Retrieved July 3, 2018, from [https://en.wikipedia.org/wiki/League\\_of\\_Legends](https://en.wikipedia.org/wiki/League_of_Legends).
- [8] List of BioWare video games. (2018, May 22). Retrieved May 23, 2018, from [https://en.wikipedia.org/wiki/List\\_of\\_BioWare\\_video\\_games](https://en.wikipedia.org/wiki/List_of_BioWare_video_games)
- [9] McDonald, TK. (2016, May 6). The Industry Handbook: Software Industry. Retrieved July 3, 2018, from <https://www.investopedia.com/articles/markets/050416/industry-handbook-software-industry.asp>
- [10] Nunneley, S. (2018, May 8). Battlefield 5 will feature "unique battles" and new challenges, Anthem to be designed around player input. VG247. Retrieved May 8, 2018, from <https://www.vg247.com/2018/05/08/battlefield-5-unique-battles-challenges-anthem/>
- [11] Steam, The Ultimate Online Game Platform. (2018). Retrieved June 27, 2018, from <https://store.steampowered.com/about/>
- [12] Superannuation. (2014, Jan 15). How Much Does It Cost To Make A Big Video Game?. Kotaku. Retrieved June 27, 2018, from <https://kotaku.com/how-much-does-it-cost-to-make-a-big-video-game-1501413649>
- [13] Video Game Industry. (2018, June 24). Retrieved June 24, 2018, from [https://en.wikipedia.org/wiki/Video\\_game\\_industry](https://en.wikipedia.org/wiki/Video_game_industry)
- [14] Video Game Industry - Statistics & Facts. (2018, June 27). Retrieved June 27, 2018, from <https://www.statista.com/topics/868/video-games/>
- [15] Video gaming in China (2018). Retrieved June 27, 2018, from [https://en.wikipedia.org/wiki/Video\\_gaming\\_in\\_China](https://en.wikipedia.org/wiki/Video_gaming_in_China)
- [16] Ye, J. (2018, Jan 8). How big is China's gaming industry?. Retrieved June 27, 2018, from <https://www.scmp.com/video/business/2127327/how-big-chinas-gaming-industry>
- [17] Some guest speaker [todo]